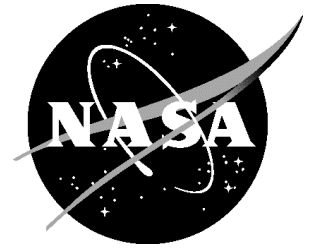


NASA Facts

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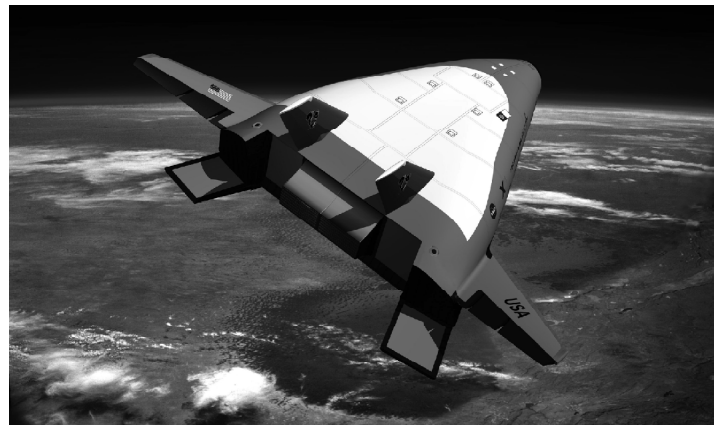


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Current X-Planes at a Glance

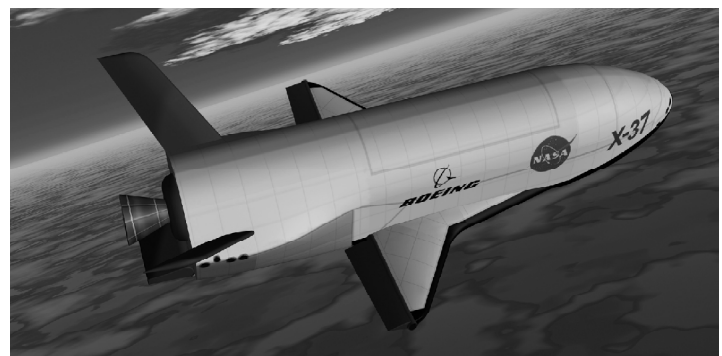
The X-33, X-34, and X-37 programs are technology demonstration vehicles designed to pave the way for full-scale, commercially developed reusable launch vehicles that will increase safety and reliability while lowering the cost of access to space from \$10,000 to \$1,000 per pound.

The X-33 is an unpiloted technology demonstrator being developed under a joint cooperative agreement between NASA and Lockheed Martin leading to a future commercially developed and operated single-stage-to-orbit Reusable Launch Vehicle (RLV). The X-33 is a half-scale prototype of Lockheed Martin's proposed RLV called the "VentureStar." The X-33 takes off vertically like a rocket and lands horizontally like an airplane. During 15 flights, it is projected to reach an altitude of up to 60 miles and speeds approaching 13 times the speed of sound demonstrating, in the process, advanced single-stage-to-orbit technologies.



The X-34 is a smaller, reusable, suborbital, unpiloted, air-launched technology demonstrator developed under contract with NASA by Orbital Sciences Corp. The X-34 will drop from Orbital's L-1011 airplane, ignite its engine and fly preprogrammed flight profiles before making automated approaches and landings on a conventional runway—a first for an American launch system. It is capable of flying up to eight times the speed of sound and reaching altitudes of approximately 50 miles. The X-34 will demonstrate quick turnaround, high-reliability capabilities and serve as a technology testbed for future reusable space transportation vehicles.

The unpiloted **X-37** advanced orbital technology demonstrator is an experimental space plane developed by Boeing Co. under a cooperative agreement with NASA. It will be transported into space by the Space Shuttle, then released by the Shuttle's robot arm. After release, the X-37, which can perform extended missions in orbit, will be NASA's first "Access to Space" demonstrator to fly both orbital and reentry environments, operating at speeds up to 25 times the speed of sound before making an automated runway landing back on Earth.



The X-38 and X-43 programs are prototypes designed to prove different technologies that can be used to lower the cost of producing future reusable vehicles.



The X-38 is a prototype for the Crew Return Vehicle (CRV) “lifeboat/ambulance” for the International Space Station. The CRV will provide seven astronauts on the International Space Station a rescue vehicle in case of a medical or other emergency requiring evacuation of the station.

The X-43 is a prototype, hypersonic aircraft that will validate design technology for airframe-integrated, “air-breathing” hypersonic engines. This type of engine installed in a vehicle traveling to space promises to reduce the cost to space by increasing payload capacity. The X-43 will carry less oxygen onboard for fuel ignition. Instead, the airframe acts as a “scoop” extracting oxygen from the atmosphere. Flights planned are two at seven times the speed of sound (Mach 7) and one at 10 times the speed of sound (Mach 10).

